LAMININ α2-LIKE ANTIGENS IN CNS DENDRITIC SPINES

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Antibodies to the G-domain of the α2 chain of laminin (formerly M-chain of merosin) reveal immunolabeling of capillary basement membranes and, unexpectedly, very distinctive labeling of hippocampal subfields in brains of rat, rabbit, pig, and nonhuman primates. Immunoelectron microscopic analysis of rat and rabbit hippocampus localized immunoreactivity to dendritic processes, primarily to spines. The first appearance of spine-associated laminin α2 immunoreactivity in the developing rat hippocampus corresponded to the time of active synaptogenesis. Entorhinal cortical lesions in mature rats dramatically decreased laminin α2 immunoreactivity in the denervated molecular layer of the dentate gyrus, thus reflecting the synaptic and concomitant spine loss of granule cell dendrites. Immunoblot analysis revealed 80 kD and 140-160 kD proteins as the neuronal laminin α2-like antigens. Both *in situ* hybridization and Northern blot analysis with laminin α2-specific probes did not detect significant signals in adult brain. However, RT-PCR clearly demonstrated laminin α2 mRNA in brain and RT-PCR *in situ* hybridization localized the transcript primarily to the choroid plexus. Thus, results suggest a novel laminin α2-like antigen in CNS dendrites and spines. Since proteins with homology to the G-domain of laminin α2, such as neurexins and agrin, have been associated with synaptogenesis, we are following the hypothesis that the laminin α2-like antigen might have an important function in CNS synapses.

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